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To: Assistant Commissioner for Patents
Washington, D.C. 20231

Sir: Transmitted herewith for filing is the patent application of:

Inventor: H. KAWAMICHI et al (See Attached List)

For:
COINCIDENCE METHOD FOR DISTRIBUTION SYSTEM

Enclosed are:

4 Sheets of Drawings

This application is being filed without an executed Declaration.

Priority is claimed from Japanese Application No. 11-322118
filed November 12, 1999. A certified copy is attached herewith.

Copies of the disclosure documents listed on the attached PTO 1449 form and
 discussed in the specification or attached Information Disclosure Statement.

A verified statement to establish small entity status under 37 CFR 1.9 and 1.27.

Specification: Abstract , Description 13 pages; and 15 claim(s).

Preliminary Amendment.

Executed Declaration.

The filing fee is calculated as shown below:

Small Entity

Large Entity

For:	No. Filed	No. Extra
Basic Fee		
Total Claims	15 -20 =	* 0
Indep Claims	3 - 3 =	* 0
<input type="checkbox"/> Multiple Dependent Claim (s)		

* If difference is less than zero
then enter '0' in second column

Rate	Fee
	\$ 345
x 9	\$
x 39	\$
+ 130	\$
Total	\$

OR

Rate	Fee
	\$ 690
x 18	\$ 0
x 78	\$ 0
+ 260	\$ 0
Total	\$ 690

A check in the amount of \$ 690.00 is enclosed for the filing fee.

The Commissioner is hereby authorized to charge any additional fees that may be required to
Deposit Account No. 50-1417.

Respectfully Submitted,

By:

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Registration No. 34,663

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JC760 U.S. PTO

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NIT-228
NT0147US

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NIT-228
NT0147US

Title of the Invention

COINCIDENCE METHOD FOR DISTRIBUTION SYSTEM

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COINCIDENCE METHOD FOR DISTRIBUTION SYSTEM

BACKGROUND OF THE INVENTION

The present invention relates to a method for coincidence
5 among common data which is distributed and held in a distribution
system having one or more elements including a computation
device to enter or withdraw into/from the system.

In a distribution system where plural data bases holding
master data and its partial sets as duplicate data are
10 distributed, as to duplicate-data update, a data update control
method and apparatus for distribution data base system disclosed
in Japanese Unexamined Patent Publication No. H10-320356 is
known.

In this method, the master data base side holding the
15 master data holds an update history file, and upon master data
update, the master data base side updates the update history
file. Upon reception of reference request, the update history
file of the master data is referred to, and if the file has been
updated, the data of the master data base is obtained. By this
20 arrangement, the master data base and the duplicate data base
can be independently updated, and time necessary for the master
data base update can be reduced.

In the common-data coincidence method in the conventional
distribution system as described above in which master data
25 exists, a device which holds the master data and never withdraws

from the system must be provided, and such device usually is a redundant element. Otherwise, if the device holding the master data withdraws from the system, the system cannot function.

5 Further, there is a high probability that the system cannot function due to the above feature when the device holding the master data is broken. To avoid such inconvenience, plural devices must hold the master data. In this case, such devices may be redundant elements.

10 Further, an abnormality detection device of multiple processing system to detect valid data from the abovementioned multiplexed data performs detection based on the assumption that the number of devices which output valid data is large. Accordingly, in a system controlled by a human manager or the 15 like, a problem occurs when a large number of outputs are not always valid data. Further, in a case where the number of element devices is too large, as coincidence among all the data cannot be obtained without difficulty, problems occur in the above-described method.

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SUMMARY OF THE INVENTION

The present invention has been made in consideration of the above situation to provide a method for managing distributed common data to manage data without distinction between master 25 data and duplicate data. It is an object of the present

invention to manage the common data distributed and held by devices in the system without redundancy of element by obtaining coincidence among the common data based on the number of devices holding common data of the same value. In the data management, 5 a significance level indicating the validity of data is defined, and data coincidence is obtained by weighting data by using the significance level.

To attain the above object, the present invention provides a distribution system having plural elements including one or more computation devices, in which upon occurrence of entrance or withdrawal of the elements, common data is distributed and held without distinction between master data and duplicate data among these plural common data. Further, in the system, coincidence among these data is obtained based on majority rule.

15 In the majority rule, a significance level is defined for each common data, and the significance level is used as a weight in the majority rule for coincidence among the common data. The majority rule here means a rule to obtain data coincidence in correspondence with the number of devices having the same data 20 value among the element devices. The significance level is defined based on the number of updates. Otherwise, the significance level is defined based on data update event. Otherwise, the significance level is defined based on data update time.

25 The common data coincidence by majority rule is obtained

in accordance with a request from the element. Otherwise, the common data coincidence by majority rule is obtained in accordance with access to any common data. Otherwise, the common data coincidence by majority rule is obtained 5 periodically in accordance with previously established information defined in advance. Otherwise, the common data coincidence by majority rule is obtained at a preprogrammed time based on the previously established information. The established information may be changed by a user during the 10 operation of the distribution system. Further, the coincidence processing is repeated.

As described above, as coincidence can be obtained among common data distributed and held without distinction between master data and duplicate data, redundant element is not necessary even in a system having elements which entry or 15 withdraw into/from the system. Further, the influence of breakage of master-data holding device on peripheral elements as in the conventional system can be reduced. Further, as the significance level defined for each data or device is used as 20 a weight in the majority rule, the validity of data obtained as a result of majority rule can be increased. Further, by repeating the data coincidence processing, more data coincidence can be obtained.

Other features and advantages of the present invention 25 will be apparent from the following description taken in

conjunction with the accompanying drawings, in which like reference characters designate the same name or similar parts throughout the figures thereof.

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BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate embodiments of the invention and, together with the description, serve to explain the principles of the invention.

Fig. 1 is a perspective view showing an example where the present invention is applied to a sales price management system in a retail store or the like;

Fig. 2 illustrates an established information management table held in an IC tag attached to a product;

Fig. 3 is a table showing the contents of established information changing request to a product;

Fig. 4 is a flowchart showing processing in IC tag initial setting and setting change;

Fig. 5 is a flowchart showing coincidence processing on common data distributed and held in IC tags;

Fig. 6 is a table showing coincidence processing starting condition held in the IC tag; and

Fig. 7 is a block diagram showing a system construction for application of the present invention to an advertisement method.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Preferred embodiments of the present invention will now be described in detail in accordance with the accompanying 5 drawings.

(First Embodiment)

Fig. 1 is a perspective view showing a selling price management system in a retail store or the like, to which the information coincidence method for distribution system of the present invention is applied. Numeral 1 denotes a shelf-type showcase of products in the retail store. The showcase 1 has products 2 on display. The products 2 may be soft drink cans or perishable food products. Further, the products 2 have different selling prices in respective retail stores. Further, 10 IC tags 3 are attached to these products. The IC tag 3 holds information as shown in Fig. 2. In Fig. 2, a product ID 11 is information indicating the type of product to which the tag is attached. A price 12 is information indicating the actual 15 selling price of the product to which the IC tag 3 is attached. In the example of this figure, the price is 100 Yen.

20 Further, an effective term 13 indicates a term during which the setting of the price 12 is effective and the price 12 is used as an actual selling price. For example, the effective term 13 is utilized when the price is changed only 25 during a predetermined period of a sale or the like. Further,

in this example, in the effective term 13, a start date is not set, and an end date is December 30, 1999. In this case, the price 12 is effective from the point where the effective term 13 was set.

5 Further, the effective term 13 can be set as an endless term. Otherwise, the effective term 13 may be set as a time sale period or the like. In such case, it may be arranged such that the time at which a customer has taken the product from the showcase 1 is stored into the IC tag 3, and it is determined 10 whether the price is a time sale price or not. Further, a standard price 14 indicates a normal time selling price after the expiration of the effective term 13. In Fig. 1, reference numeral 4 denotes a device which sets the established 15 information as shown in Fig. 2 of the IC tag 3. An operator 5 who manages selling prices performs selling-price initial setting by the device 4. The setting is limitedly performed to uniformly change the price of related products, upon selling price initial setting, setting change or the like. Upon setting, 20 the device 4 transmits information as shown in Fig. 3 to the IC tag 3 attached to the product 2 by wireless communication.

Fig. 4 shows the flow of processing in the IC tag 3 which received the information from the device 4. At all times, the IC tag 3 waits for reception of established information changing request. First, at step ST1, an established information 25 changing request message is received from the device 4. The

received message, as shown in Fig. 3, has an item ID 21 indicating the type of product as a request transmission destination, a price 22 to be set, and an effective term 23 indicating a term during which the price 22 is effective as a selling price of 5 the product 2. Next, the process proceeds to step ST2, at which it is determined whether or not the item ID 21 of the received established information changing request message is valid. For example, it is determined whether or not the item ID 11 held in the IC tag 3 corresponds with the item ID 21 of the received established information changing request message. It is determined as a result of determination at step ST2 that the item ID is valid, the process proceeds to step ST3, at which the price 12 and the effective term 13 held in the IC tag 3 are replaced with the price 22 and the effective term 23 of the established information changing request. At the completion 15 of the processing, the IC tag again waits for the established information changing request. Further, if it is determined at step ST2 that the item ID is not valid, the process ends, and the IC tag waits for the reception of established information 20 changing request.

Next, Fig. 5 shows the flow of processing of common data coincidence method in the distribution system of the present invention. First, at step ST11, it is determined whether or not established time has come, otherwise, it is determined 25 whether or not time of established cycle has elapsed since the

execution of previous information coincidence processing. It may be arranged such that the IC tag 3 holds information such as starting time 31 and last starting time 32 indicating the time of previous information coincidence processing, and an 5 established cycle 33, used at step ST1, in the form of table as shown in Fig. 6. The starting time 31 may be plural times. Further, the starting time 31 and the established cycle 33 may not be set.

If it is determined at step ST11 that the starting time 10 has not come or time of the established cycle has not elapsed, the process proceeds to step ST12. At step ST12, it is determined whether or not a previously-defined event as a starting trigger of the coincidence processing has occurred. The event is e.g. entry/withdrawal of element or access to the 15 common data. In this embodiment, the event can be purchase of the product 2 by a customer, replenishment of the products 2 which are running short, or checking of the price 12 held in the IC tag 3. If it is determined at step ST12 that the event has not occurred, the process proceeds to step ST13. At step 20 ST13, it is determined whether or not a coincidence request has been received from another element. If it is determined that no coincidence request has been received from another element, after a predetermined waiting period, the process returns to step ST11. If it is determined at step ST11 that the set starting 25 time has come or time of the established cycle has elapsed, the

process proceeds to step ST14.

Further, if it is determined at step ST12 that the event has occurred, the process proceeds to step ST14. Further, if it is determined at step ST13 that a coincidence request has 5 been received from another element, the process proceeds to step ST16. At this time, a correction message for an internal clock held in the IC tag 3 is also received, and based on the message, the internal clock of the IC tag 3 is corrected. When the correction message is received, coincidence processing on the common data of the set time and the set cycle by the time indicated by the correction message is cancelled. At step ST14, the elements are acquired. The acquisition of the elements can be made by using a survival signal which each element periodically transmits. The elements in this embodiment are all the products 15 2 (IC tags 3) in the same showcase 1.

Next, the process proceeds to step ST15, at which a coincide request message is transmitted to these elements. At this time, a correction message to the internal clock of the IC tag 3 of each element is attached to the coincidence request 20 message, then the coincidence message is transmitted. At step ST16, as to the common data to which the coincidence request has been made, the data held in the IC tag 3 is transmitted. The common data here is, e.g., the price 12 and the effective term 13 held in the IC tag 3. Further, at step ST17, the common 25 data transmitted at step ST16 is received. It may be arranged

such that the acquisition of the message is made for a predetermined period, and then the process proceeds to step ST18. Otherwise, it may be arranged such that, based on the number of elements obtained at step ST14, the process proceeds to step 5 ST18 if a predetermined numbers of messages are obtained.

At step ST18, it is determined whether or not the common data must be updated. In this determination, only the messages obtained at step ST17 are used. Among the messages obtained at step ST17, the data value owned by the largest number of messages is used as common data value. Regarding respective data, a significance level is set for each device or each data in the IC tag 3, and the significance level is utilized as a weight in the above determination. The determination by significance level is made since the number of common data is unfixed, and determination cannot be performed simply by 15 majority rule when the products have high data reliability though the number of the products is small from the start.

Accordingly, in such case, the significance level may be increased in proportion to the number of data updates.

20 Otherwise, the significance level may be increased upon data update by the device 4. Otherwise, the significance level may be increased upon direct data setting by a user. Otherwise, in accordance with data update time, the significance level of late update data may be increased. If it is determined as a 25 result of determination that the common data must be updated,

the process proceeds to step ST19, to update the common data.

If all the obtained data do not correspond with each other, it may be determined that the coincidence processing has not been performed on all the data, and coincidence request may be 5 made again. Then, after a predetermined waiting period, the process returns to step ST11. Further, if it is determined at step ST18 that the common data is not to be updated, the process returns to step ST11 after a predetermined waiting period. Thus the coincidence processing enables data input without setting different selling prices for respective retail stores upon arrival of products.

Note that the present invention is also applicable to a product advertisement method by using a system as shown in Fig. 7. When coincidence is obtained among the selling prices, the 15 advertisement information including the coincidence-processed selling price may be transmitted from a store processing apparatus via a network such as the Internet to customer processing apparatuses. Further, the information may be transmitted from the product to the customers without the store 20 processing apparatus. Further, communication with the customers is not limited to the transmission to the customer processing apparatuses, but may be made via facsimile or telephone transmission. Further, the advertisement may be displayed on a display device in a store or the like instead 25 of being transmitted to the customers.

Further, electronic commerce may be performed in the system in Fig. 7 using a coincidence-processed price. For this purpose, among product information stored in the store processing apparatus, information indicating the price is 5 corrected to the coincidence-processed price. Then, electronic commerce is performed based on the corrected price.

The present invention is not limited to the above embodiments and various changes and modifications can be made within the spirit and scope of the present invention. Therefore, to appraise the public of the scope of the present invention, the following claims are made.

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CLAIMS

1. An information coincidence method for a distribution system having plural elements each including a computation device, comprising the steps of:

5 supplying common data of common type indicating features of said elements to said respective elements;

receiving said common data by at least one of said plural elements from other elements, and based on said common data and said common data received from other elements, determining by said computation device the content of common data for coincidence among said plural elements; and

correcting the content of the common data of said plural elements to coincide with each other based on the determined content.

15 2. An information coincidence method according to claim 1, wherein said step of determining the content of said common data is performed by majority rule.

3. An information coincidence method according to claim 1, further comprising the step of defining a significance level 20 for each common data,

wherein said step of determining the content of said common data is performed by majority rule using said significance level.

4. An information coincidence method according to claim

25 1, further comprising the step of defining a significance level

for each element,

wherein said step of determining the content of said common data is performed by majority rule using said significance level.

5 5. An information coincidence method according to claim 1, wherein said method is performed when any of said common data is accessed.

6. An information coincidence method according to claim 1, wherein said method is performed periodically.

10 7. An information coincidence method according to claim 1, wherein said method is performed at a predetermined time.

8. An information coincidence method according to claim 7, wherein said significance level is set based on the number of data updates in said element, and is utilized as a weight in majority rule for coincidence among said common data.

9. An information coincidence method according to claim 7, wherein said significance level is set based on a data update event in said element.

10 10. An information coincidence method according to claim 7, wherein said significance level is set in correspondence with data update time in said element.

11. A distribution system having plural elements each including a computation device, wherein each element comprising:

25 means for holding common data of common type indicating

features of said element;

means for receiving said common data by at least one of said plural elements from other elements, and based on said common data and said common data received from other elements,
5 determining by said computation device the content of common data for coincidence among said plural elements; and

means for correcting the contents of the common data of said plural elements based on the determined contents.

12. A distribution system according to claim 11, wherein
10 said means for determining the content of said common data determines the content by majority rule.

13. A distribution system according to claim 11, further comprising means for defining a significance level for each common data,
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wherein said means for determining the content of said common data determines the content by majority rule using said significance level.

14. A distribution system according to claim 11, further comprising means for defining a significance level for each
20 element,

wherein said means for determining the content of said common data determines the content by majority rule using said significance level.

15. A product advertisement method comprising the steps
25 of:

providing a computation device to respective plural products of the same type;

providing price data indicating a price to said respective products;

5 receiving said price data by at least one of said plural products from other products, and based on said price data and said price data received from other products, determining by said computation device a price as price data for coincidence among said plural products;

10 controlling said price data in said plural products to coincide with each other based on the determined price;

transmitting said coincide-processed price data to a store apparatus of a store handling said products; and

15 transmitting advertisement information including said coincidence-processed price data from said store apparatus via a network to customer apparatuses of persons who can be customers of said products.

ABSTRACT OF THE DISCLOSURE

A distribution system having plural elements including one or more computation devices holds distributed common data 5 without distinction between master data and duplicate data upon entrance or withdrawal of the elements. Coincidence among the common data is obtained by majority rule. In the majority rule, a significance level is defined for each common data, and the significance level is utilized as a weight in majority rule for 10 coincidence among the common data.

FIG. 1

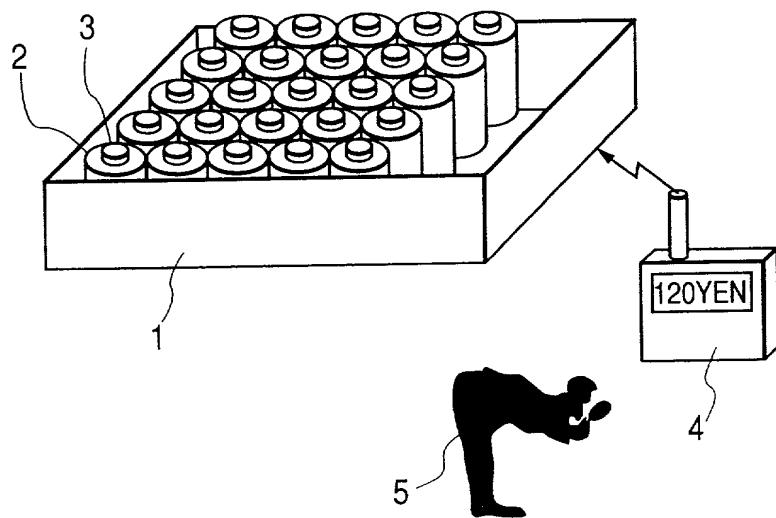


FIG. 2

11	ITEM ID	0123456789
12	PRICE	100
13	EFFECTIVE TERM	- / 1999-12-30
14	STANDARD PRICE	120

FIG. 3

21	ITEM ID	0123456789
22	PRICE	100
23	EFFECTIVE TERM	-/1999-12-30

FIG. 4

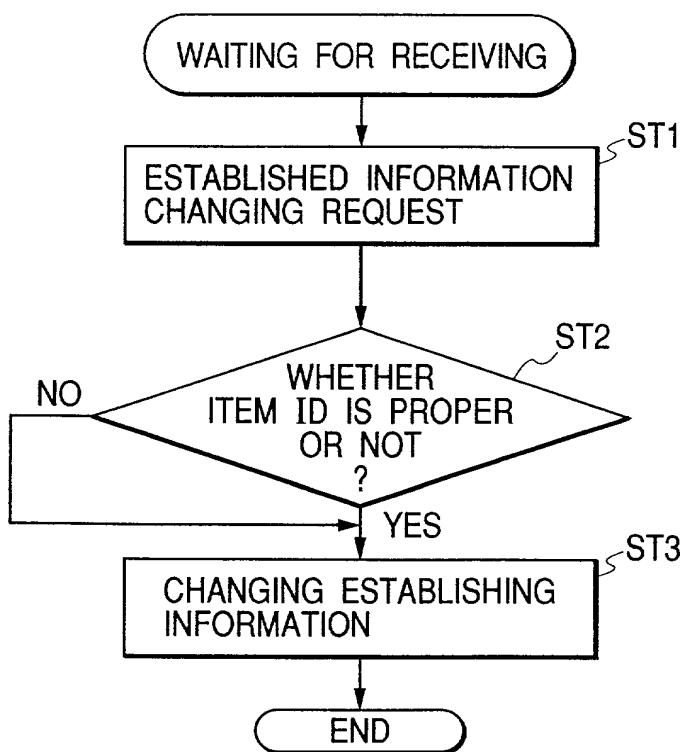


FIG. 5

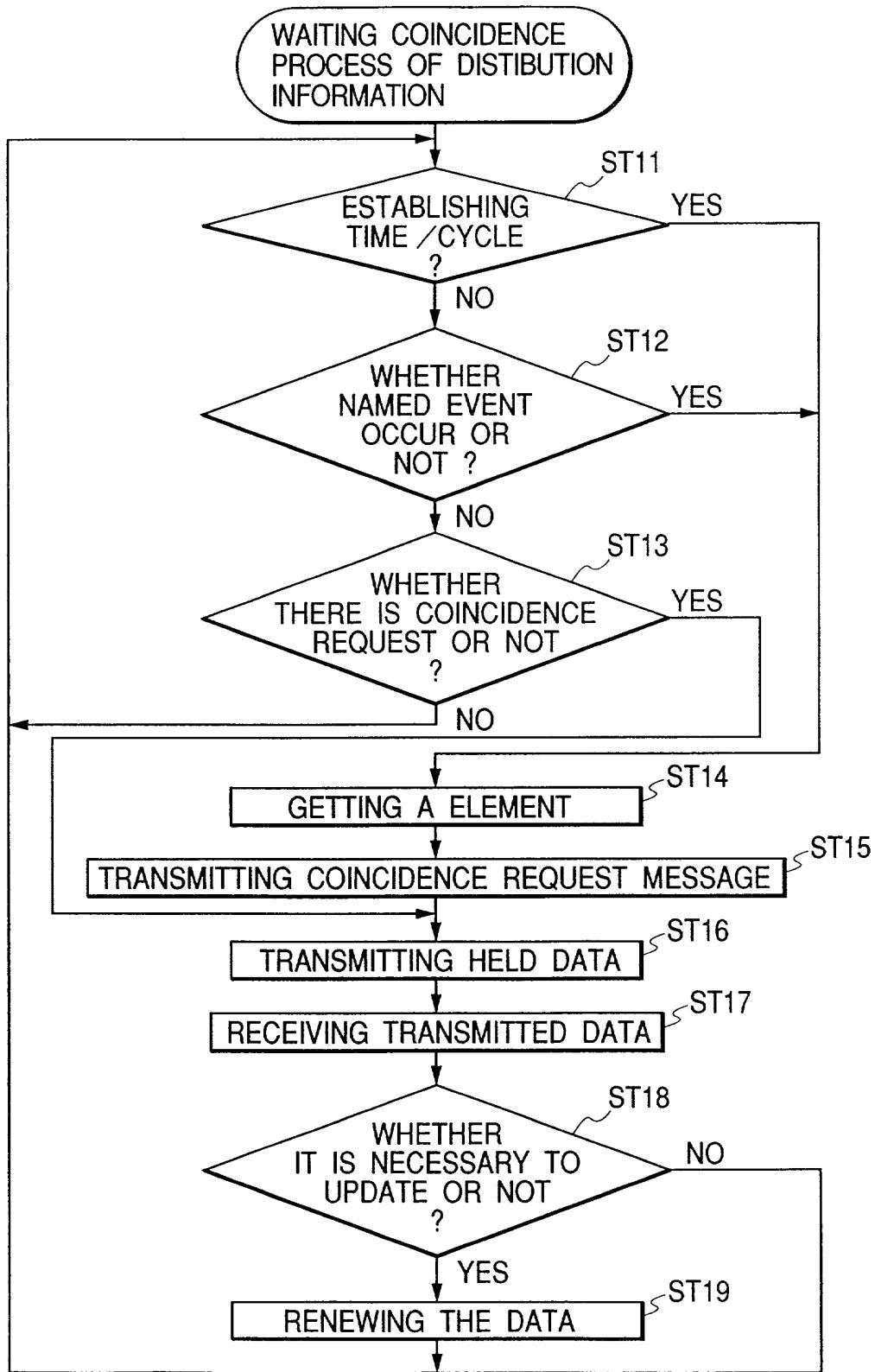
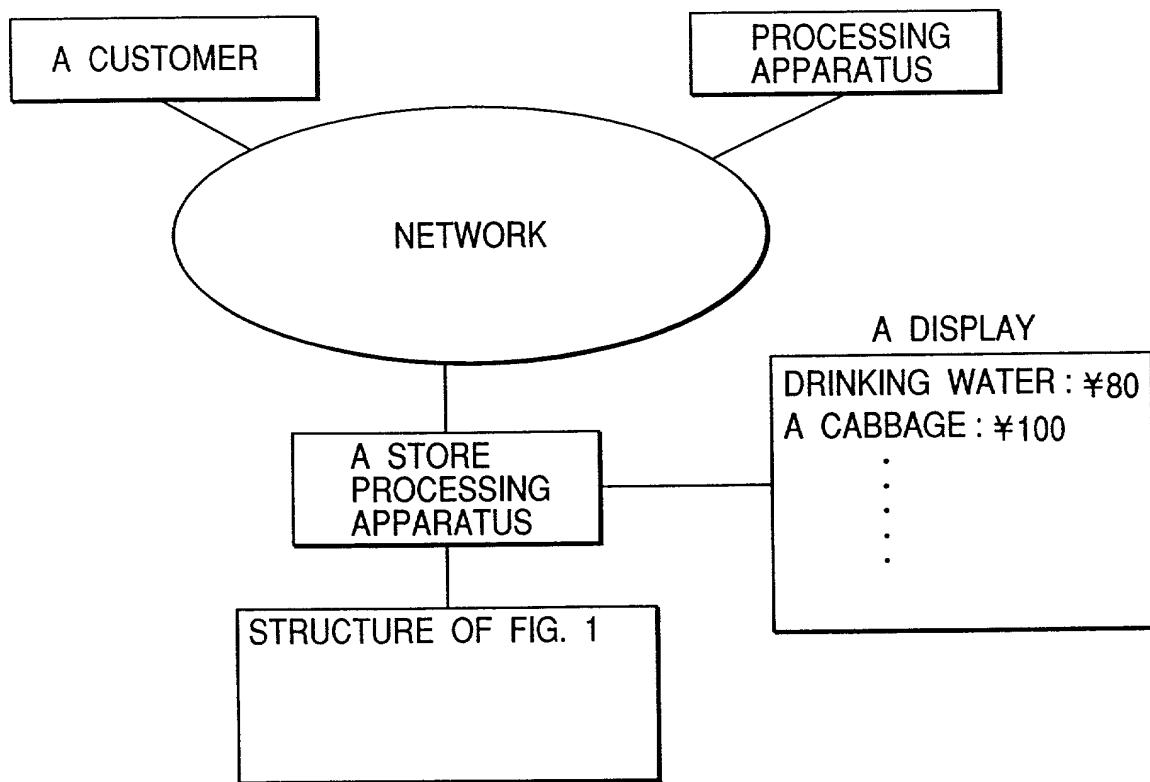


FIG. 6

31	STARTING TIME	1999-12-20 12:00
32	LAST STARTING TIME	1999-12-19 11:00
33	ESTABLISHING CYCLE	1:00

FIG. 7



Declaration and Power of Attorney For Patent Application

特許出願宣言書及び委任状

Japanese Language Declaration

日本語宣言書

下記の氏名の発明者として、私は以下の通り宣言します。

As a below named inventor, I hereby declare that:

私の住所、私書箱、国籍は下記の私の氏名の後に記載された通りです。

My residence, post office address and citizenship are as stated next to my name.

下記の名称の発明に関して請求範囲に記載され、特許出願している発明内容について、私が最初かつ唯一の発明者（下記の氏名が一つの場合）もしくは最初かつ共同発明者であると（下記の名称が複数の場合）信じています。

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

COINCIDENCE METHOD FOR DISTRIBUTION SYSTEM

上記発明の明細書（下記の欄で×印がついていない場合は、本書に添付）は、

The specification of which is attached hereto unless the following box is checked:

__月__日に提出され、米国出願番号または特許協定条約国際出願番号を_____とし、
(該当する場合) _____に訂正されました。

was filed on
as United States Application Number or
PCT International Application Number
_____ and was amended on
_____ (if applicable).

私は、特許請求範囲を含む上記訂正後の明細書を検討し、内容を理解していることをここに表明します。

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

私は、連邦規則法典第37編第1条56項に定義されるとおり、特許資格の有無について重要な情報を開示する義務があることを認めます。

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

Japanese Language Declaration (日本語宣言書)

私は、米国法典第35編119条(a) - (d)項又は365条(b)項に基き下記の、米国以外の国の少なくとも一ヵ国を指定している特許協力条約365(a)項に基づく国際出願、又は外国での特許出願もしくは発明者証の出願についての外国優先権をここに主張するとともに、優先権を主張している、本出願の前に出願された特許または発明者証の外国出願を以下に、枠内をマークすることで、示している。

Prior Foreign Application(s)

外国での先行出願

11-322118	Japan
(Number)	(Country)
(番号)	(国名)
(Number)	(Country)
(番号)	(国名)

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(Application No.)	(Filing Date)
(出願番号)	(出願日)

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(Application No.)	(Filing Date)
(出願番号)	(出願日)
(Application No.)	(Filing Date)
(出願番号)	(出願日)

私は、私自身の知識に基づいて本宣言書中で私が行なう表明が真実であり、かつ私の入手した情報と私の信じるところに基づく表明が全て真実であると信じていること、さらに故意になされた虚偽の表明及びそれと同等の行為は米国法典第18編第1001条に基づき、罰金または拘禁、もしくはその両方により処罰されること、そしてそのような故意による虚偽の声明を行なえば、出願した、又は既に許可された特許の有効性が失われることを認識し、よってここに上記のごとく宣誓を致します。

I hereby claim foreign priority under Title 35, United States Code, Section 119 (a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Priority Not Claimed
優先権主張なし

12/November/1999	<input type="checkbox"/>
(Day/Month/Year Filed)	(出願年月日)
(Day/Month/Year Filed)	(出願年月日)

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below.

(Application No.)	(Filing Date)
(出願番号)	(出願日)

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s), or 365(c) of any PCT international application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code Section 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of application.

(Status: Patented, Pending, Abandoned)	<input type="checkbox"/>
(現況:特許許可済、係属中、放棄済)	

(Status: Patented, Pending, Abandoned)	<input type="checkbox"/>
(現況:特許許可済、係属中、放棄済)	

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Japanese Language Declaration
(日本語宣言書)

委任状： 私は下記の発明者として、本出願に関する一切の手続きを米特許商標局に対して遂行する弁理士または代理人として、下記の者を指名いたします。（弁護士、または代理人の氏名及び登録番号を明記のこと）

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith (list name and registration number)
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